

*Stated Meeting, April 15, 1881.*

Present, 17 members.

President, Mr. FRALEY, in the Chair.

A photograph of Herr Göppert was received for the album, in a letter of envoy, dated Breslau, March 24, 1881.

Letters of acknowledgment were received from Herr Bernard Studer, dated Berne, March 25 (106 and List), and from the Zool. Soc. Amsterdam (105, 106 and List).

The Physical Section of the Ch. Phy. Soc. Imp. University of St. Petersburg was on motion placed on the list of correspondents to receive the Proceedings.

Donations for the Library were announced from the Russian Academy; Accad. dei Lincei at Rome; Society at Emden; Dr. Otto Wolfenstein of Valencia; Com. Geological Society, Bordeaux; Halifax Library Company; Prof. O. C. Marsh; Mr. Henry Phillips, Jr.; New Jersey Historical Society; Hamilton College, N. Y.; Wyoming Historical & Geological Society; American Journal of Pharmacy, and Am. Jour. Med. Sciences; U. S. Coast Survey; University of Virginia, and Major Jed. Hotchkiss.

A drawing and description of his improved "Centigrad Photometer" was received from D. Coglievina of Vienna.

Prof. P. E. Chase, explained certain relations of the spectrum line F with other lines and data suggesting the probable identity of hydrogen and the luminiferous æther.

Prof. Cope read a paper on the Perissodactyla.

Dr. König made remarks on Dr. P. F. Reinsch's recent plates of the microscopic lithology of anthracite and other coals.

Mr. Lesley communicated an appendix to Dr. Spencer's paper on the Lake Erie former water-basin, suggesting the probable flow of the upper Ohio from Pittsburgh to Butler, thence, via New Castle, up the present Mahoning Valley and down the Grand Valley of Ohio to Lake Erie.

On scrutiny of the ballot boxes the President declared the following persons duly elected members of the Society.

Prof. Claudio Jannet, of Paris.

Prof. Paul Leroy Beaulieu, of Paris.

M. Emile Malézieux, of Paris.

Prof. E. A. Barber, of West Philadelphia.

Dr. Jas. A. H. Murray, of Mill Hill, London.

Hon. William Butler, Judge of U. S. District Court, Eastern District of Pennsylvania.

Mr. Wm. Woodnutt Griscom, of Philadelphia.

And the meeting was adjourned.

*Photodynamic Notes, II. By Pliny Earle Chase, LL.D., Professor of Philosophy in Haverford College.*

(Read before the American Philosophical Society, April 15, 1881.)

#### 16. Weighing the Sun by a Soap Bubble.

In the well-known experiment of inflating a soap bubble with a mixture of oxygen and hydrogen, and exploding it by a candle, there is an opportunity for studying various radiodynamic relations. The equilibrium, which usually exists between the gravitation of the particles towards the sun and towards the earth, is suddenly and violently disturbed. During the restoration of equilibrium, there are simultaneous tendencies to the production of orbital velocities, about the earth and about the sun.

The height of virtual focal projection which represents elliptic orbital velocity is  $\frac{r}{2} (1 + e)$ ; the height at Earth's equatorial surface, which is

in unison with orbital projection, being  $\frac{3962.8}{2} \times 1.01677 = 2014.16$  miles.

Dividing this height by the French thermal unit ( $C = \frac{1389.6}{5280}$  mile-pounds) and multiplying by 9, because 9 pounds of gas are lifted by 1 pound of combustible, we get 68878.2 calorics as the thermal equivalent of the explosion. Naumann\* gives the following experimental values :

Thomsen .....	68376
Favre and Silbermann .....	68924
Dulong .....	69486
Hess .....	69584
Grassi .....	69332
Andrews .....	67616
Mean .....	68886

\* Handbuch der Chemie, p. 290.